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DANIEL P MORRIS
IBM CORPORATION
INTELLECTUAL PROPERTY LAW DEPARTMENT
P O BOX 218
YORKTOWN HEIGHTS, NY 10598

IM51/0625

EXAMINER MC GINTY, D

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
08/303,561

Applicant(s)

Bednorz et al.

Examiner

Douglas J. McGinty

Group Art Unit
1751



☒ Responsive to communication(s) filed on May 1, 1998 and May 14, 1998

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) 24-26, 86-90, and 96-142 is/are pending in the application

Of the above, claim(s) _____ is/are withdrawn from consideration

☒ Claim(s) 136 is/are allowed.

☒ Claim(s) 24-26, 86-90, 96-135, and 137-142 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☒ received in Application No. (Series Code/Serial Number) 08/053,307

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action. The rejections and objections, if any, from the previous Office Action have been withdrawn if not repeated in this Office Action.
2. It is requested that this Examiner be notified of all pending, related applications.¹ That notice need not be in a PTO form - 1449, however.²

Status of the Claims

3. Claims 24-26, 86-90, and 96-142 are pending.

Priority

4. Acknowledgment is made of applicant's claim for priority under 35 U.S.C. § 119. The certified copy has been filed in parent application, Serial No. 08/053,307, filed on April 23, 1993 as paper no. 28.

a. However, a review of that certified copy, which is in English, indicates that it does not support the present assertion of priority. Support is not found in that certified copy for the invention as presently claimed. See MPEP 201.13 et seq. and 201.14 et seq.

b. Applicants' arguments filed April 11, 1996, January 3, 1996, and September 29, 1995, paper nos. 53, 50, and 51, as well as the Affidavits filed September 29, 1995 and January 3, 1996, paper nos. 49 and 52, have been fully considered but they are not deemed to be persuasive. The applicants quote some passages out of the priority document and argue that the present claims are fully based that document. Nevertheless, that priority document is not deemed to provide basis for the following limitations found in the present claims:

i. The limitations "a composition including a transition metal, a rare earth or rare earth-like element, an alkaline earth element, and oxygen", as found in claim 86 (lines 2-4). The certified priority document may provide basis for the formula $RE_2TM.O_4$ at p. 2, para. 4, but the claimed composition is deemed to be much broader than that formula.

¹ See MPEP 2001.06(b).

² See MPEP 901.03.

ii. The limitation "non-stoichiometric amount of oxygen", as found in claim 86 (line 6). Basis may be seen for an oxygen deficit at p. 2, para. 4, but no such basis is seen for the more general limitation of "a nonstoichiometric amount of oxygen".

iii. The limitation "a composition exhibiting a superconductive state", as found in claim 88 (line 2), wherein the composition is a "(transition) metal oxide", as found in claims 24 (lines 1 and 2), 89 and 90. The certified priority document may provide basis for compositions of the formula $RE_2TM.O_4$, as discussed above, but "a composition", "metal oxide", or "transition metal oxide" is deemed to be much broader than the formula $RE_2TM.O_4$.

iv. The limitation "a copper-oxide compound", as recited in claim 96 (line 6). The certified priority document may provide basis for compositions of the formula $RE_2TM.O_4$, as discussed above, but "a copper-oxide compound" is not deemed to be equivalent to a composition of the formula $RE_2TM.O_4$. Basis is not seen in the certified priority document for "a copper-oxide compound" with the breadth of the present claims.

v. The limitation to the effect that "the copper oxide compound includes (including) at least one rare-earth or rare-earth-like element and at least one alkaline-earth element", as recited in claim 97 (lines 3 and 4) and claim 103 (lines 6-8). The certified priority document may provide basis for compositions of the formula $RE_2TM.O_4$, as discussed above, but basis is not seen for the more general limitation of "a copper-oxide compound" with a rare-earth (like) element and an alkaline earth element.

vi. The limitation to the effect that "the copper-oxide compound includes at least one element (oxygen) in a nonstoichiometric atomic proportion", as found in claim 101 (lines 2 and 3), 102 (lines 2 and 3), 107 (lines 2 and 3), and 108 (lines 2 and 3). Basis may be seen for an oxygen deficit as discussed above, but no such basis is seen for the more general limitation of "a nonstoichiometric atomic proportion".

vii. The limitation as to "the effectively-zero-bulk-resistivity intercept temperature $T_{p=0}$ ", as found in claim 103 (lines 13, 16, and 17). The critical temperature, T_c , is discussed throughout that certified priority document, but not $T_{p=0}$.

c. Applicants' arguments filed March 7, 1997 (#59) have been fully considered but not found to be persuasive.

i. The applicants quote portions out of the priority document and assert that those quoted sections "clearly (support) a much broader composition than the Examiner is claiming it does, and that the priority document, in fact, does support applicant's (sic) claim 86." The fact remains, nevertheless, that the priority document refers to the general formula $\text{RE}_2\text{TM.O}_4$ in which the rare earth element (RE) may be partially substituted with a Group IIA metal. That disclosure in the priority document does not provide support for the broader limitations of the present claims, which do not limit the invention to that general formula.

ii. The applicants argue that the disclosure of varying amounts of oxygen in the priority document provides support for earlier priority for the term "non-stoichiometric amount of oxygen". Again, however, that disclosure in the priority document does not provide support for the broader limitations of the present claims, which do not limit the invention to those varying amounts.

iii. The applicants urge that the disclosure in the priority document of the formula $\text{RE}_2\text{TM.O}_4$ provides support for their limitations of "transition metal", "copper-oxide compounds", "rare earth or rare earth-like elements", and "alkaline earth element". Again, however, that disclosure in the priority document does not provide support for the broader limitations of the present claims, which do not limit the invention to that formula.

iv. The applicants further "assume that the Examiner agrees with applicant's (sic) statements in their prior response in that the concept of the intercept temperature is well known in the prior art and can be included in claim 103." No basis is seen for that assumption. As noted in the previous Office Action and repeated above, the term " $T_{p=0}$ " is not found in the priority document. Well known or not, there is no basis for that term in the priority document.

d. Applicants' arguments filed May 1, 1998 (#64) and May 14, 1998 (#62) have been fully considered but not found to be persuasive. The applicants' arguments have been fully discussed above.

Claim Rejections - 35 USC § 112

5. The specification is objected to under 35 U.S.C. § 112, *first paragraph*, as failing to provide an enabling disclosure commensurate with the scope of the claims.

a. The present specification is deemed to be enabled only for compositions comprising $\text{Ba}_x\text{La}_{5-x}\text{Cu}_5\text{O}_y$. The art of high temperature (above 30°K) superconductors is an extremely unpredictable one. Small changes in composition can result in dramatic changes in or loss of superconducting properties. The amount and type of examples necessary to support broad claims increases as the predictability of the art decreases.³ Claims broad enough to cover a large number of compositions that do not exhibit the desired properties fail to satisfy the requirements of 35 USC 112.⁴ Merely reciting a desired result does not overcome this failure.⁵ In particular, the question arises: Will any layered perovskite material containing copper exhibit superconductivity? Also, does any stoichiometric combination of rare earth, an alkaline earth, and copper elements result in an oxide superconductor?

b. It should be noted that at the time the invention was made, the theoretical mechanism of superconductivity in these materials was not well understood. That mechanism still is not understood. Accordingly, there appears to be little factual or theoretical basis for extending the scope of the claims much beyond the proportions and materials actually demonstrated to exhibit high temperature superconductivity. A "patent is not a hunting license. It is not a reward for the search, but a reward for its successful conclusion".⁶

³See In re Fisher, 166 USPQ 18, 24; and In re Angstadt and Griffen, 190 USPQ 214, 218. See also, In re Colianni, 195 USPQ 150, 153, 154 (CCPA 1977) (J. Rich).

⁴See In re Cook, 169 USPQ 298, 302; and Cosden Oil v. American Hoechst, 214 USPQ 244, 262.

⁵See In re Corkill, 226 USPQ 105, 1009.

⁶See Brenner v. Manson, 383 US 519, 148 USPQ 689.

c. **Claims 24-26, 86-90, 96-113, 129-131, 134, 135, and 139-142 are rejected under 35 U.S.C. § 112, *first paragraph*, for the reasons set forth in the objection to the specification.**

d. Applicants' arguments filed April 11, 1996, January 3, 1996, and September 29, 1995, paper nos. 53, 50, and 51, as well as the Affidavits filed September 29, 1995 and January 3, 1996, paper nos. 49 and 52, have been fully considered but they are not deemed to be persuasive.

i. The additional caselaw and arguments by the applicants have been duly noted. For the reasons that follow, however, the record as a whole is deemed to support the initial determination that the originally filed disclosure would not have enabled one skilled in the art to make and use the invention to the scope that it is presently claimed.

ii. The applicants quote several passages from their specification at pp. 13-15 of their September 29, 1995 Amendment, but the issue is the scope of enablement, not support. The present disclosure may or may not provide support for particular embodiments, but the issue here is the scope to which that disclosure would have taught one skilled in the art how to make and use a composition which shows the onset of superconductivity at above 26°K.

iii. Construed in light of that issue, the invention is not deemed to have been fully enabled by the disclosure to the extent presently claimed.

(1) In their September 29, 1995 Amendment, the applicants argue that their disclosure refers to "the composition represented by the formula RE-TM-O, where RE is a rare earth or rare earth-like element, TM is a nonmagnetic transition metal, and O is oxygen", and list several species such as " $\text{La}_{2-x}\text{Ba}_x\text{CuO}_{4-y}$ " which they indicate are found in the present disclosure.

(2) Notwithstanding that argument, it still does not follow that the invention is fully enabled for the **scope** presently claimed. The claims include formulae which are much broader than the RE-TM-O formula cited in the disclosure. Claim 24 recites "a transition metal oxide", claim 88 "a composition", and claim 96 "a copper-oxide compound".

(a) The present specification actually shows that known forms of "a transition metal oxide", "a composition", and "a copper-oxide compound" do **not** show the onset of superconductivity at above 26°K. At p. 3, line 20, through p. 4, line 9, of their disclosure, the applicants state that the prior art includes a "Li-Ti-O system with superconducting onsets as high as 13.7°K." Official Notice is taken of the well-known fact that Ti is a transition metal. That disclosure also refers to "a second, non-conducting CuO phase" at p. 14, line 18.

(b) Accordingly, the present disclosure is not deemed to have been fully enabling with respect to the "transition metal oxide" of claim 24, the "composition" of claim 88, or the "copper-oxide compound" of claim 96.

(3) The examples at p. 18, lines 1-20, of the present specification further substantiates the finding that the invention is not fully enabled for the scope presently claimed.

(a) With a 1:1 ratio of (Ba, La) to Cu and an x value of 0.02, the La-Ba-Cu-O form (i.e., "RE-AE-TM-O", per p. 8, line 11) shows "no superconductivity".

(b) With a 2:1 ratio of (Ba, La) to Cu and an x value of 0.15, the La-Ba-Cu-O form shows an onset of superconductivity at " $T_c = 26^\circ\text{K}$ ". It should be noted, however, that **all** of the claims in this application require the critical temperature (T_c) to be "in excess of 26°K" or "greater than 26°K".

(c) Consequently, the present disclosure is not deemed to adequately enable the full scope of the present claims. Independent claims 86 and 103 may require the presence of rare earth, alkaline earth, and transition metals, but the aforementioned examples show that superconductivity is still very unpredictable. Those claims cannot be deemed to be fully enabled.

iv. The applicants also have submitted three affidavits attesting to the applicants' status as the discoverers of materials that superconduct $> 26^\circ\text{K}$. Each of the affidavits further states that "all the high temperature superconductors which have been developed based on the work of Bednorz and Muller behave in a similar manner (way)". Each of the affidavits add "(t)hat once a person of skill in the art knows of a specific transition metal oxide composition

which is superconducting above 26°K, such a person of skill in the art, using the techniques described in the (present) application, which includes all known principles of ceramic fabrication, can make the transition metal oxide compositions encompassed by (the present) claims ...without undue experimentation or without requiring ingenuity beyond that expected of a person of skill in the art." All three affiants apparently are the employees of the assignee of the present application.

(1) Those affidavits do not set forth particular facts to support the conclusions that all superconductors based on the applicants' work behave in the same way and that one skilled in the art can make those superconductors without undue experimentation. Conclusory statements in an affidavit or specification do not provide the factual evidence needed for patentability.⁷

(2) Those affidavits do not overcome the non-enablement rejection. The present specification discloses *on its face* that only certain oxide compositions of rare earth, alkaline earth, and transition metals made according to certain steps will superconduct at > 26°K.

(3) Those affidavits are not deemed to shed light on the state of the art and enablement *at the time* the invention was made. One may know *now* of a material that superconducts at more than 26°K, but the affidavits do not establish the existence of that knowledge on the filing date for the present application. Even if the present application "includes all known principles of ceramic fabrication", those affidavits do not establish the level of skill in the ceramic art as of the filing date of that application.

(4) It is fully understood that the applicants are the pioneers in high temperature metal oxide superconductivity. The finding remains, nonetheless, that the disclosure is not fully enabling for the scope of the present claims.

e. Applicants' arguments filed March 7, 1997 (#59) have been fully considered but they are not persuasive.

i. The applicants quote a statement from part of the previous Office Action and asserts that the "Examiner does not support this statement with any case law citations."

⁷See In re Lindner, 173 USPQ 356, 358 (CCPA 1972).

(1) That assertion is incorrect. Seven decisions have been cited as providing the legal basis for this determination of non-enablement.⁸

(2) The applicants further "note that the Examiner seemed to have specifically avoided applying (sic) the case law and, consequently, ... applicants take the Examiner's silence as concurrence in the manner that applicants have applied this case law." Apparently, the applicants are referring to their discussion⁹ of the caselaw previously cited by this Examiner. Notwithstanding the applicants' commentary on caselaw, the April 15, 1997 Office Action, paper no. 54, sets forth the factual basis for the determination of non-enablement at pp. 5-10.

(3) The applicants still further argues "that the Examiner does not rebut the case law and argument provided by applicants on (pages) 15-25 of their September 29, 1995 amendment which addresses (these issues) in detail." The point remains, nevertheless, that there appears to be a concurrence as to the applicable caselaw. That caselaw speaks for itself. What has been fully addressed in the previous Office Action and repeated above is the factual basis for the determination of non-enablement for the scope of the present invention.

ii. The applicants urge that "their disclosure supports a substantially broader scope than (particular) species." With respect to transition metals, the applicants point to the support in their disclosure and argue that they were enabled for transition metals other than just copper. Again, however, it is noted that high temperature superconductivity is a highly unpredictable art. In view of the record as a whole, it is again determined that one skilled in the art would not have been enabled to practice the presently disclosed invention with transition metals other than copper.

iii. The applicants argue that their own examples do not support the determination of non-enabling scope of the invention. Nevertheless, the record is viewed as a

⁸See footnotes 1-4 in the April 15, 1996 Office Action, paper no. 54. See also, the corresponding sections of this Office Action.

⁹See pp. 12-25 of the September 29, 1995 Amendment, paper no. 50.

whole. If the applicants could not show superconductivity with a $T_c > 26^\circ\text{K}$ for certain compositions falling within the scope of the present claims, it is unclear how someone else skilled in the art would have been enabled to do so at the time the invention was made.

iv. The applicants assert that "(b)y the Examiner's statement that these (statements in the affidavits) are conclusionary (sic) the Examiner appears to be placing himself up as an expert in the field of superconductivity" and "respectfully request that the Examiner submit an affidavit in the present application rebutting the position taken by applicants' 3 affiants." Notwithstanding those assertions, this Examiner has determined that those affidavits were insufficient because they were conclusory only, i.e., they lacked particular facts to support the conclusions reached.

v. The applicants argue that the "Examiner has provided no substantial evidence to support this assertion (of non-enabling scope of the invention). It is respectfully requested that the Examiner support (his) assertion with factual evidence and not unsupported statements." Nevertheless, the determination of non-enabling scope is maintained for the reasons of record.

f. Applicants' arguments filed May 1, 1998 (#64) and May 14, 1998 (#62) have been fully considered but not found to be persuasive.

i. The applicants argue that the "standard of enablement for a method of use is not the same as the standard of enablement for a composition of matter" and that their claimed invention is enabling because it is directed to a method of use rather than a composition. Basis is not seen for that argument, to the extent that it is understood. It is noted that 35 USC 112, first paragraph, reads as follows:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Process of use claims also would be subject to the statutory provisions of 35 USC 112, first paragraph.

ii. The applicants assert that the "Examiner has not shown by evidence not contained within applicants' teaching that the art of high T_C superconductors is unpredictable in view of applicants' teaching" (spelling and punctuation errors corrected). To the extent that the same assertion is understood, the rejection is maintained for the reasons of record.

iii. The applicants point to "Copper Oxide Superconductors" by Charles P. Poole, Jr., et al., (hereinafter, "the Poole article") as supporting their position that higher temperature superconductors were not that difficult to make after their original discovery.

(1) Initially, however, it should be noted that the Poole article was published *after* the priority date presently claimed. As such, it does not provide evidence of the state of the art *at the time* the presently claimed invention was made.

(2) Moreover, the present claims are directed to processes of using metal oxide superconductors, **not** processes of making them. Even if the Poole article provided direct evidence of the state of the art at the time the invention was made, which it apparently does not, that evidence still does not pertain to the issue at hand, namely, the process of using metal oxide superconductors to conduct electricity under superconducting conditions.

(3) Finally, the Preface states in part at A3: "The unprecedented worldwide effort in superconductivity research that has taken place over the past two years has produced an enormous amount of experimental data on the properties of the copper oxide type materials that exhibit superconductivity above the temperature of liquid nitrogen. ... During this period a consistent experimental description of many of the properties of the principal superconducting compounds such as BiSrCaCuO, LaSrCuO, TlBaCaCuO, and YBaCuO has emerged. ... The field of high-temperature superconductivity is still evolving ..." That preface is deemed to show that the field of high-temperature superconductivity continued to grow, on the basis of on-going basic research, *after* the Bednorz and Meuller article was published.

iv. The applicants submitted three affidavits, one each from Drs. Tsuei, Dinger, and Mitzi which were signed in May of 1998.

(1) Except for one change, those three affidavits are the same as the ones submitted before and discussed above.

(2) Those affidavits have been changed to indicate that the present application "includes all known principles of ceramic fabrication known at the time the application was filed." However, that additional indication also is considered to be a conclusory statement unsupported by particular evidence.

v. This Office Action is deemed to be a complete discussion of all relevant issues raised by the applicants.

6. Claims 134, 135, and 137-142 are rejected under 35 U.S.C. 112, *first paragraph*, as based on a disclosure which is not enabling.

a. Each of claims 134, 135, and 137-142 provide for a superconductor "having a T_c greater than 26°K", but those claims do not provide for a step of -- maintaining said (superconductor) at a temperature less than said T_c --.

b. Those claims are not enabled because they lack the critical step of maintaining the appropriate temperature for superconductivity.¹⁰

7. Claims 86-87, 96-108, 115, 118, 120, 122, 123, 129-135, and 137-142 are rejected under 35 U.S.C. § 112, *second paragraph*, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. With respect to claims 86-87 and 96-108, the terms "layer-type", "perovskite-like", "rare-earth-like" are vague and confusing.

i. The question arises: What is meant by these terms?

ii. Applicants' arguments filed April 11, 1996, January 3, 1996, and September 29, 1995, paper nos. 53, 50, and 51, as well as the Affidavits filed September 29, 1995 and January 3, 1996, paper nos. 49 and 52, have been fully considered but they are not deemed to be persuasive.

¹⁰See In re Mayhew, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

(1) The terms "layer-type" and "perovskite-like" are unclear because the "type" or "like" terms are deemed to be indefinite. Terms such as "like", "similar", and "type" are indefinite.¹¹ It is suggested that "layer-type perovskite-like crystal structure" be changed -- a substantially layered perovskite crystal structure --.

(2) The applicants respond that "(a) person of skill in the art would understand (rare earth-like) to mean that a location occupied by a rare earth element can also be occupied by another element which would have chemical properties similar enough to the rare earth elements such that it would fit in to the latter (sic - lattice?) site occupied by the rare earth element." That response does not alleviate the problem, however. Other elements may "fit" into the lattice but they may not necessarily be "rare-earth-like". It is suggested that the same language be changed to -- Group III B --, per p. 7, line 11, of the present specification.

b. Claims 112, 113, 115, 117, 118, 120, 122, and 123 are found to be indefinite for the reasons that follow.

i. In claim 112, line 5, has the terms "layer-type" and "perovskite-like", both of which are indefinite.

ii. In claim 113, line 5, has the terms "layer-type" and "perovskite-like", both of which are indefinite.

iii. Claim 115, lines 2-4, is indefinite with the language "forming a composition including copper, oxygen and **any** element selected from the group consisting of at least one Group IIA element and an element selected from the group consisting of a rare earth element and a Group IIIB element" (emphasis added). That language is unclear as to whether the Group IIA element must be present along with either the rare earth or Group IIIB element. It is suggested that "any" be changed to -- an -- in line 2.

iv. In claim 117, line 5, has the terms "layer-type" and "perovskite-like", both of which are indefinite.

¹¹See Ex parte Remark, 15 USPQ 2d 1498, 1500 (BPAI 1990); Ex parte Kristensen, 10 USPQ 2d 1701, 1703 (BPAI 1989); Ex parte Attig, 7 USPQ 2d 1092, 1093 (BPAI 1988); and Ex parte Copenhaver, 109 USPQ 118 (POBA 1955).

v. In claim 118, line 5, has the terms "layer-type" and "perovskite-like", both of which are indefinite.

vi. Claim 120 is unclear the "copper oxide" of line 5 is the "transition metal" and "oxygen" of line 2.

vii. Claim 120, lines 2-4, is indefinite with the language "any element selected from the group consisting of at least one Group IIA element and an element selected from the group consisting of a rare earth element and a Group IIIB element" (emphasis added). That language is unclear as to whether the Group IIA element must be present along with either the rare earth or Group IIIB element. It is suggested that "any" be changed to -- an -- in line 2.

viii. In claim 122, line 5, has the terms "layer-type" and "perovskite-like", both of which are indefinite.

ix. In claim 123, line 5, has the terms "layer-type" and "perovskite-like", both of which are indefinite.

x. Claim 123, line 12, has the typographical error of " T_c ".

c. Claims 129-142 are found to be indefinite for the reasons that follow.

i. Claim 129, last two lines, have the phrase "through said composition while exhibiting said superconductivity", which is unclear as to *what* is exhibiting superconductivity. It is suggested that the same phrase be changed to -- through said composition with said phase exhibiting said superconductivity --.

ii. Claim 130, line 3, is unclear with the term "being". It is suggested that the same term be deleted.

iii. Claim 131, line 2, apparently should have -- maintaining -- instead of "maintaing".

iv. Claim 131, line 4, is unclear with the term "therein". It is suggested that the same term be replaced with -- in said superconducting copper oxide --.

v. Claim 132, line 4, is unclear with the term "superconducting"

vi. Claim 133, line 2, has an apparent misspelling of -- maintianing --.

vii. Claim 133, line 4, is unclear with the language "superconducting current".
It is suggested that the same language be changed to -- superconducting electrical current --.

viii. Claim 134, line 1, is unclear with the language "superconducting current".
It is suggested that the same language be changed to -- superconducting electrical current --.

ix. Claim 135, line 1, is unclear with the language "superconducting current".
It is suggested that the same language be changed to -- superconducting electrical current --.

x. Claim 137, line 1, is unclear with the language "superconducting current".
It is suggested that the same language be changed to -- superconducting electrical current --.

xi. Claim 138, line 1, is unclear with the language "superconducting current".
It is suggested that the same language be changed to -- superconducting electrical current --.

xii. Claim 139, line 1, is unclear with the language "superconducting current".
It is suggested that the same language be changed to -- superconducting electrical current --.

xiii. Claim 140, line 1, is unclear with the language "superconducting current".
It is suggested that the same language be changed to -- superconducting electrical current --.

xiv. Claim 141, line 1, is unclear with the language "superconducting current".
It is suggested that the same language be changed to -- superconducting electrical current --.

xv. Claim 142, line 1, is unclear with the language "superconducting current".
It is suggested that the same language be changed to -- superconducting electrical current --.

xvi. Claim 142, line 2, apparently should have -- T_c --.

d. Applicants' arguments filed March 7, 1997 (#59) have been fully considered but they are not persuasive.

i. The applicants assert "that the Examiner has not responded to applicants' comments which supports applicants' position that a person of skill in the art would understand the terms 'layer-type' and 'perovskite-like' and has just repeated their rejection of the prior Office Action." That assertion is not correct, since April 15, 1996 Office Action, paper no. 54, addressed the applicants' comments at pp. 8 and 9.

ii. The prior Office Action included a proposed amendment to overcome this rejection, which has been repeated above.

e. Applicants' arguments filed May 1, 1998 (#64) and May 14, 1998 (#62) have been fully considered but not found to be persuasive. The applicants' arguments have been fully discussed above.

Claim Rejections - 35 USC § 102

8. Claims 24-26, 86-90, 96-135, and 137-142 are rejected under 35 U.S.C. § 102(a) as being anticipated by Asahi Shinbum, International Satellite Edition (London), November 28, 1986 (hereinafter, "the Asahi Shinbum article").

a. As discussed in paper no. 20 of the ancestral application, 07/053,307, it is not fully clear to what exact date applicants are entitled. Based on the record, nonetheless, that date would appear to be no later than around December 13, 1986, the date samples were tested in the US to show superconductivity. See MPEP 715 et seq. The Asahi Shinbum article was published on November 28, 1986.

b. The reference confirms superconductivity in an oxide compound of La and Cu with Ba having a structure of the so-called perovskite structure. Although the reference fails to teach use of the testing of zero resistance for confirming superconductivity, it inherently must have been used because it is one of two methods used for testing for superconductivity (the other being diamagnetism). Accordingly, the burden of proof is upon the applicants to show that the instantly claimed subject matter is different from and unobvious over that taught by this reference.¹²

c. Applicants' arguments filed April 11, 1996, January 3, 1996, and September 29, 1995, paper nos. 53, 50, and 51, as well as the Affidavits filed September 29, 1995 and January 3, 1996, paper nos. 49 and 52, have been fully considered but they are not deemed to be persuasive.

i. The applicants argue that the Sung II Park Affidavit of March 30, 1988 states at para. 4 that measurements were taken of a superconductive sample on or before

¹²See In re Brown, 173 USPQ 685, 688; In re Best, 195 USPQ 430; and In re Marosi, 218 USPQ 289, 293.

November 9, 1986, to the best of the affiant's recollection, or no later than November 15, 1986.

The documentary evidence is not deemed to support that argument, however. See MPEP 715.07.

(1) Plots of those measurements are missing. See the Chang C. Tsuei Affidavit of March 30, 1988, para. 6. A hand-drawn diagram with the indication of vacuum pumping on November 9, 1988 also is not deemed to show that the measurements were taken.

(2) Moreover, the other evidence in the record appears to show that high temperature superconductivity was not attained in this country as of November 9 or 15, 1986. The March 30, 1986 Declaration of Richard L. Greene includes a series of cablegrams sent by Dr. Greene to the applicants in Zurich, Switzerland as Exhibit B. On both November 11, 1986 and November 14, 1986, Dr. Greene reports that no indication of superconductivity has been seen in his specific heat measurements for temperatures of 4-35°K. Exhibit C has pages dated December 1, 1986 on, and Exhibit D, which actually has plots of resistance vs. temperature, has an earliest date of December 3, 1996.

ii. The applicants assert that the Asahi Shinbum article reports a third party's confirmation of their original discovery. That assertion appears to be correct, but the article still is deemed to be prior art under 35 USC 102(a).

(1) It should be noted again, however, that the applicants' discovery was not originally made in this country and that they cannot show an earlier date than December 1986 for their invention in this country. The Asahi Shinbum article was published on November 28, 1986.

(2) The applicants cite four decisions¹³ which do not directly apply to the present facts.

¹³One decision is cited in the January 4, 1996 Supplementary Response, paper no. 51: In re Katz, 215 USPQ 14 (CCPA 1982). Three decisions are cited in the April 11, 1996 Supplementary Response, paper no. 53: Andrews v. Hovey, 123 US 267 (1887); Ex parte Lemieux, 115 USPQ 148 (POBA 1957); and Ex parte Powell and Davies, 37 USPQ 285 (POBA 1938).

(a) The In re Katz¹⁴ decision held that an applicant may overcome an article as 35 USC 102(a) prior art by showing that the applicant was a co-author and that the other co-authors were under the direction and control of the applicant. Here, however, the applicants were neither co-authors in the Asahi Shinbum article nor did they exercise direction and control over the work reported in that article.

(b) The Andrews v. Hovey¹⁵ decision involved a grace period which is now codified in 35 USC 102(b). The present case involves a printed publication as prior art under 35 USC 102(a).

(c) The Ex parte Powell and Davies¹⁶ decision held that an applicant's own foreign patent which issued within the grace period cannot be used against him or her, and the Ex parte Lemieux¹⁷ decision applied that reasoning to an applicant's own article published in another country. Again, the present applicants had no part in the writing of the Asahi Shinbum article.

(3) The present facts may raise a novel issue of law.¹⁸ The applicants were the first to develop the presently claimed invention, but the earliest date they can show for

¹⁴See In re Katz, *supra*, 215 USPQ at 17, 18. See also, MPEP 716.10.

¹⁵See Andrews v. Hovey, *supra*.

¹⁶See Ex parte Powell and Davies, *supra*, 37 USPQ at 285, 286.

¹⁷See Ex parte Lemieux, *supra*, 115 USPQ at 149. See also, MPEP 715.01(c).

¹⁸The applicants did not cite In re Mathews, 161 USPQ 276, 277-279 (CCPA 1969), which held that an applicant may overcome a patent as prior art under 35 USC 102(e) with evidence that the applicant provided the knowledge for the disclosure in that patent. By contrast, the present facts involve prior art under 35 USC 102(a) with a publication date **before** the invention was in this country.

that invention in this country is December of 1986.¹⁹ The Asahi Shinbum article was published in November of 1986 and describes the development of superconductivity with an oxide of La, Ba, and Cu having a perovskite structure by a third party, but that article apparently indicates that the third party was confirming the discovery of the present applicants. Notwithstanding the possible uniqueness of the present facts, however, the Asahi Shinbum article still is deemed to be prior art under 35 USC 102(a), which the applicants have not been able to overcome with a showing of an earlier date in this country or a showing of their direction and control over the work done by that third party.

d. Applicants' arguments filed March 7, 1997 (#59) have been fully considered but they are not persuasive.

i. The applicants argue that "Praveen Chaudhari brought these samples back to the U.S. when he returned after visiting (the inventors) on or about October 16, 1986. When these samples came into the United States since they were inherently superconductive as claimed, the invention was essentially reduced to practice in the United States on that date." As stated before repeated above, however, the applicants were unable to show the attainment of superconductivity any earlier than December 3, 1986 in this country. Again, the present invention is directed to the method of superconducting electricity. That *method* apparently was not reduced to practice before December 3, 1986.

ii. The applicants further urge that they have shown clear diligence from before November 28, 1986 until actual reduction at or around December 3, 1986. Nevertheless, the actual reduction in this country is deemed to have occurred on December 3, 1986, which is after the publication date for the reference.

iii. The applicants assert that they should be entitled to a one-year grace period for their own published invention, but this prior art rejection is based on 35 USC 102(a) because the author of that reference is a different inventive entity.

¹⁹The applicants' proposed priority date for the EPO application is January 23, 1987, which is after the December 1986 dates show by the Richard L. Greene Affidavit.

iv. The applicants argue: "If one would follow the rationale of the Examiner, if an applicant publishes an article and some other third party reports that same result prior to applicant's filing of a patent application which is subsequently filed within one year of applicant's own publication (, the) reporting of applicant's work by the third party would be prior art against applicant's application. Such a result would deny (the applicant) the one year grace period provided under 35 USC 102(b)." The applicants' argument is duly noted, but again, it is further noted that the reference is prior art under 35 USC 102(a). The reference is not just a republication of the applicants' article. Instead, the reference is the reporting of someone else's work which confirms the applicants' work. The applicants also are not able to show a priority date which pre-dates the publication of that reference. Usually, an applicant can establish an earlier priority date with an earlier foreign filing, but the EPO priority document in this case was filed on January 23, 1987, or by earlier conception and diligent reduction to practice, but in this case the invention was made outside of this country.

v. This Office Action is deemed to be a complete discussion of all relevant issues raised by the applicants.

e. Applicants' arguments filed May 1, 1998 (#64) and May 14, 1998 (#62) have been fully considered but not found to be persuasive. The applicants argue that the presently claimed invention is novel and non-obvious over the *prior* art, but for the reasons of record, however, the aforementioned reference is found to constitute prior art. The applicants' arguments have been fully discussed above.

Claim Rejections - 35 USC § 103

9. Claims 24-26, 86-90, 96-135, and 137-142 are rejected under 35 U.S.C. § 103 as being unpatentable over the Asahi Shinbum article.

a. The reference is relied upon as set forth in the previous rejection. This reference may differ from the present claims in that it may fail to disclose the presently claimed method of "causing an electric current to flow in the superconductor element". It was notoriously well-known in the art of superconductors that a method of utilizing superconductive materials was to cause an electric current to flow in the material while it is cooled below its transition temperature.

See MPEP 706.02(a). Accordingly, it would have been well within the purview of one of ordinary skill to use the present claimed method with the materials disclosed by the reference. One would have been motivated to cool the material of the reference to below the transition temperature and cause electric current to flow in the material to provide electricity without resistance. Accordingly, the present claims are unpatentable in view of the prior art of record.

b. Applicants' arguments filed April 11, 1996, January 3, 1996, and September 29, 1995, paper nos. 53, 50, and 51, as well as the Affidavits filed September 29, 1995 and January 3, 1996, paper nos. 49 and 52, have been fully considered but they are not deemed to be persuasive. The Asahi Shinbum article is deemed to be prior art under 35 USC 102(a) for the reasons discussed above.

c. Applicants' arguments filed March 7, 1997 (#59) have been fully considered but not found to be persuasive. The applicants' arguments have been fully discussed above.

d. Applicants' arguments filed May 1, 1998 (#64) and May 14, 1998 (#62) have been fully considered but not found to be persuasive. The applicants' arguments have been fully discussed above.

Allowable Subject Matter

10. Claim 136 is allowable.

11. The following is an Examiner's statement of reasons for the indication of allowable subject matter:

a. The Asahi Shinbum article teaches in general that perovskite-like compounds of La, Cu, and Ba have a T_c of 30°K, but that article apparently does not teach the particular formula in the amendment suggested above. The examples in the present specification are deemed to show criticality for that formula as recited in claim 136.

b. Support for the proposed amendment is found at p. 20, line 1, through p. 25, line 5, and in Figure 3.

c. This indication of allowable subject matter is subject to further consideration and review.

Conclusion


12. All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.129(a) and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.129(a).

a. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the submission under 37 CFR 1.129(a). See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

b. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas J. McGinty, whose telephone number is (703) 308-3805. The examiner normally can be reached on Monday through Friday from 8:30 A.M. to 5:00 P.M., Eastern time. If *reasonable* attempts to reach the examiner by telephone are unsuccessful, however, the examiner's supervisor, Mr. Paul Lieberman, can be reached at (703) 308-2523. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661. The fax number for this Group is (703) 305-3600.

June 24, 1998
303561.5


Douglas J. McGinty
Primary Examiner
Group 1100